UCRL-JC-122219 Abs

Effect of the Gent-McWilliams Tracer Transport Parameterization on the Simulated Distribution of Natural 14C in the Ocean

P. B. Duffy and K. Caldiera (Global Climate Research Division, Lawrence Livermore National Laboratory, 7000 East Ave., Livermore, CA 94550 USA; 1–510–422–3722; internet: pduffy@llnl.gov)

Simulated distributions of natural ^{14}C in the ocean are commonly used by ocean modelers to evaluate the realism of their models. In particular, the ability to properly simulate natural ^{14}C indicates whether or not ventilation rates of the simulated thermocline and deep ocean are correct. We analyze two coarse-resolution simulations of the distribution of natural ^{14}C in the ocean made with an enhanced version of the GFDL Modular Ocean Model. The simulations are identical except that one uses the Gent-McWilliams parameterization of transport of tracers by subgrid scale eddies, and the other uses strictly horizontal subgrid scale mixing. The Gent-McWilliams parameterization has been shown to significantly improve the simulated temperature distribution in the GFDL model. However, we show that in our configuration of the model, the Gent-McWilliams parameterization results in concentrations of natural ^{14}C in the deep ocean which are lower than observed and lower than those simulated with horizontal mixing.

This work was performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract No. W-7405-Eng-48.

1. 1996 Ocean Sciences Meeting
2. 07737891
3. (a) P.B. Duffy, L-256, Lawrence Livermore National Lab, P.O. Box 808, Livermore, Ca. 94550

   (b) tel: (510) 422-3722
   (c) fax: (510) 422-6388
   (d) email: pduffy@llnl.gov
4. 0
5. (a) 06 Tracer Oceanography
   (b) 4255, 4860, 4568, 4520, 4806
   (c) N/A
6. N/A
7. 0%
8. $60 check enclosed
9. C
10. N/A
11. No